



CGMS-34, NOAA-WP-07
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Agenda Item: I.1
Discussed in WG1

Preparation for World Radiocommunication Conference 2007

NOAA-WP-07 presents a summary of agenda items for the International Telecommunication Union's 2007 World Radiocommunication Conference concerning metsat radio frequencies. Also included are the CGMS objectives as well as the current status of studies associated with each agenda item.

CGMS Members are encouraged to actively support protection of the metsat frequencies addressed by these agenda items, through their appropriate radio frequency management representatives, in the development of proposals and positions within their administration's preparatory process for the CPM and WRC-07.

Preparation for World Radiocommunication Conference 2007

1. Introduction

This paper contains proposed objectives for consideration by CGMS members relative to metsats on the agenda of the 2007 World Radio Communication Conference (WRC-07). The contents may be used by CGMS members to inform their Administrations, and to facilitate conference preparation and WRC consideration.

The presentation is organized to align with Agenda for the WRC-07 as presented in Resolution 802 (WRC-03). Not all of the items in this agenda are of interest to the CGMS, therefore only those specific agenda items relating to metsat issues are discussed herein.

2. Items for Consideration by Members

The CGMS should support the use of space-based passive sensors to provide vital ecological and environmental data that are unobtainable by any other means. Such passive sensors depend for their successful operation on frequency bands that are defined by the physical laws of the atmosphere and Earth's surface.

The CGMS should also support spectrum efficiency and recognize the need for and the value of sharing frequency bands between more than one radio service, in cases where mutually agreed sharing and protection criteria have been established based on the results of International Telecommunication Union-Radiocommunication (ITU-R) studies.

However, in frequency bands allocated to the Earth exploration-satellite (passive) service, where sharing with active systems has been shown to be not feasible, the CGMS must support the view that such active systems should not be implemented, and support views by administrations that might lead to a reduction in the number of such infeasible sharing situations in the Table of Frequency Allocations.

Agenda Item 1.2 “to consider allocations and regulatory issues related to the Earth exploration-satellite (passive) service, space research (passive) service and the meteorological satellite service in accordance with Resolutions 746 (WRC-03) and 742 (WRC-03)”

Resolution 746 (WRC-03) resolves 1 calls for sharing analyses between geostationary meteorological satellites operating in the space-to-Earth direction and the fixed, fixed-satellite and mobile services in the band 18-18.4 GHz to define appropriate sharing criteria with a view to extending the current 18.1-18.3 GHz geostationary meteorological satellites allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum. This will satisfy the requirement for the transmission of data from high resolution sensors on the next generation

geostationary meteorological satellites, which will be launched in the time-frame 2015-2020.

CGMS Objective

CGMS supports this expansion of the current 18 GHz allocation for transmission of high rate data from geostationary meteorological satellites. CGMS members are encouraged, through the appropriate radio frequency management representatives, to take an active role in the development of proposals and positions that support expansion of this metsat allocation at the CPM and WRC-07 within their administration's preparatory process for the CPM and WRC-07.

Status

Working Party 7B prepared the final draft of the Conference Preparatory Meeting (CPM) text at its August-September meeting, incorporating comments from Working Party 4A and other contributions to the meeting. The text supports expansion of the allocation by 100 MHz at either end of the current 18.1-18.3 GHz band. The draft text was forwarded to the CPM Chapter 2 Rapporteur for consideration. The CPM report will be finalized in February 2007 and available prior to the World Radiocommunication Conference in October-November 2007.

Resolution 746 (WRC-03) resolves 2 calls for sharing analyses between the EESS (passive) and the SRS (passive) and the fixed and mobile services in the band 10.6-10.68 GHz to determine appropriate sharing criteria. The EESS (passive) operating in the band 10.6-10.68 GHz may experience harmful interference from the emissions of systems of active services. The band 10.6-10.68 GHz is of primary interest for the measurement of rain, snow, sea state, ocean wind and soil moisture.

CGMS Objective

CGMS support the protection of the passive services from the active services in the 10.6-10.68 GHz band. CGMS members are encouraged, through the appropriate radio frequency management representatives, to take an active role in the development of proposals and positions within their administration's preparatory process for the CPM and WRC-07 that support protection of this passive allocation at the CPM and WRC-07.

Status

Final draft CPM text produced at WP7C's August-September 2006 provided methods to increase existing protection to the passive allocation in 10.6-10.68 GHz band by limiting emissions from the co-primary active services. Existing active systems would be "grandfathered" to operate under current conditions.

Resolution 742 (WRC-03) calls for sharing studies between the passive services and the fixed and mobile services in the band 36-37 GHz in order to define appropriate sharing criteria. EESS (passive) systems may experience harmful interference if a high density of fixed or mobile service stations is deployed in the band 36-37 GHz.

CGMS Objective

CGMS support the protection of EESS (passive) systems and encourage its members to consider carefully any deployment of fixed or mobile service stations in the 36-37 GHz band within their administrations. CGMS members are encouraged, through the appropriate radio frequency management representatives, to take an active role in the development of proposals and positions within their administration's preparatory process for the CPM and WRC-07 that support protection of this passive allocation at the CPM and WRC-07.

Status

Final draft CPM text produced at WP7C's August-September 2006 provided methods to protect passive sensors operating in 36-37 GHz by limiting emissions from the co-primary active services. The few existing active systems would be "grandfathered" to operate under current conditions.

Agenda Item 1.4 "to consider frequency-related matters for the future development of IMT (International Mobile Telecommunications) -2000 and systems beyond IMT-2000 taking into account the results of ITU-R studies in accordance with Resolution 228 (Rev.WRC-03)"

Any allocation to the IMT-2000 systems in bands already allocated to the meteorological aids, meteorological-satellite, Earth exploration-satellite, and space research services could pose a threat to those services.

CGMS Objective

The CGMS objectives are to protect space science services allocations that may be considered for allocation to IMT-2000 and future systems, and support suppression of Resolution 228 (Rev. WRC-03) and to ensure that the provisions regarding the use of the 2110 – 2120 MHz band are not further eroded to accommodate the future requirements of IMT-2000 and systems beyond IMT-2000. CGMS members are also encouraged, via the appropriate radio frequency management representatives within their administration, to take an active role in the development of proposals and positions within their administration's preparatory process for the CPM and WRC-07 that support these objectives.

Status

Working Party 8F together with Working Party 8D at their September 2006 meetings concluded on draft CPM text based on comments from interested parties on a variety of issues relating to services and markets to be provided by and/or envisaged for the future development of IMT-2000 and systems beyond IMT-2000. For developing countries and countries with large areas of low population densities, bands below 1 GHz are being considered; details concerning candidate bands can be found in ITU-R document 8F/899 Chapter 5, Part1, attachment 5.7.

Agenda Item 1.5 “to consider spectrum requirements and possible additional spectrum allocations for aeronautical telecommand and high bit-rate aeronautical telemetry, in accordance with Resolution 230 (WRC-03)”

Resolution 230 (WRC-03) calls for additional allocations between 3 and 30 GHz for wideband aeronautical telemetry and associated telecommand. The impacts to existing allocations to meteorological aids, meteorological-satellite, Earth exploration-satellite, and space research need to be considered as new allocations to wideband aeronautical telemetry and associated telecommand are pursued.

CGMS Objective

The CGMS objective is to protect existing space science services allocations and to support the studies that may lead to additional allocations in the 3 to 30 GHz band for aeronautical telecommand and high bit-rate aeronautical telemetry, which may also be used during atmospheric testing by space agencies. CGMS members are also encouraged, via the appropriate radio frequency management representatives within their administration, to take an active role in the development of proposals and positions within their administration’s preparatory process for the CPM and WRC-07 that support this objective.

Status

Working Party 8B concluded on draft CPM text which identifies all or portions of the 4400-4940 MHz, 5030-5250 MHz and 5925-6700 MHz bands for aeronautical telemetry under the aeronautical mobile service. Bands above 16 GHz are no longer being pursued. Studies in Region 1 (Europe, Africa and the Middle East) support a spectrum requirement of 105 MHz while studies in Region 2 (North and South America) lead to a 650 MHz requirement. Working Party 8B met again in September 2006 and concluded on the CPM text for this agenda item.

Agenda Item 1.6 “to consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, in accordance with Resolution 414 (WRC-03) and, to study current satellite frequency allocations that will support the modernization of civil aviation telecommunication systems, taking into account Resolution 415 (WRC-03)”

Resolution 414 (WRC-03) calls for a review of bands allocated to aeronautical systems in the frequency range between 108 MHz and 6 GHz, and to determine whether additional allocations to the aeronautical mobile (R) service are required. Existing allocations to meteorological-satellites and Earth exploration-satellites need to be taken into account during the studies of possible new allocations to the aeronautical mobile service.

CGMS Objective

The CGMS objective is to protect existing space science services allocations in the 108 MHz and 6 GHz bands. CGMS members are encouraged, through the appropriate radio frequency management representatives within their

administrations, to take an active role in the development of proposals and positions within their administration's preparatory process for the CPM and WRC-07.

Status

At its September 2006 meeting Working Party 8B concluded on draft CPM text which identifies all or portions of the 960-1164 MHz and 5000-5150 MHz bands for AM(R)S to support long-range bi-directional air-ground voice and data communications and broadband airport surface communications.

Agenda Item 1.8 "to consider the results of ITU-R studies on technical sharing and regulatory provisions for the application of high altitude platform stations operating in the bands 27.5-28.35 GHz and 31-31.3 GHz in response to Resolution 145 (WRC-03), and for high altitude platform stations operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz in response to Resolution 122 (Rev.WRC-03)"

Resolution 145 (WRC-2003) calls for technical sharing criteria or high altitude platform stations (HAPS) system design conditions to ensure that HAPS applications in the fixed service operate successfully on a non-harmful interference, non-protected basis in the bands 27.5-28.35 GHz and 31-31.3 GHz. The 31.3-31.8 GHz band is allocated to the radio astronomy, Earth exploration-satellite (passive) and space research (passive) services. WRC-03 amended No. 5.543A to specify signal levels that would protect satellite passive services and radio astronomy stations in the band 31.3-31.8 GHz.

HAPS unwanted emission limits as given in footnote 5.543A may have to be revised in light of modifications to Recommendation ITU-R SA.1290 (see also Agenda Item 1.20).

CGMS Objective

CGMS support the need for protection of the 31.3-31.8 allocation to the radio astronomy, Earth exploration-satellite (passive) and space research (passive) services. CGMS members are encouraged, through the appropriate radio frequency management representatives within their administrations, to take an active role in the development of proposals and positions within their administration's preparatory process for the CPM and WRC-07.

Status

Working Party 4-9S completed draft CPM text for this agenda item in August 2006. Studies focused on issues related to HAPS sharing with broadband wireless access and fixed-satellite service systems, and no consideration is being given to revisiting the EESS (passive) sharing criteria.

Agenda item 1.18 "to review pfd limits in the band 17.7-19.7 GHz for satellite systems using highly inclined orbits, in accordance with Resolution 141 (WRC-03)"

Resolution 141 (WRC-03) calls for studies to determine whether the current pfd limits for non-GSO systems in the FSS in Article 21 are adequate to protect the fixed service in the 17.7-19.7 GHz band from non-geostationary systems without unduly constraining the use of these non-GSO FSS systems, and to determine whether there are technical and operational measures in the band 17.7-19.7 GHz that could be implemented in the fixed service to mitigate interference from FSS space stations. The band 18.1-18.3 GHz is allocated to the meteorological-satellite service (space-to-Earth) on a primary basis, limited to geostationary satellites and in accordance with the provisions of Article 21, Table 21-4, under footnote 5.519. The band 18.6-18.8 MHz is allocated to EESS (passive).

CGMS Objective

CGMS support the protection of these existing science service allocations. CGMS members are encouraged, through the appropriate radio frequency management representatives within their administrations, to take an active role in the development of proposals and positions within their administration’s preparatory process for the CPM and WRC-07.

Status

Working Party 4-9S completed draft CPM text in August 2006 which summarizes conflicting study results including those that conclude that no changes are needed to the current power flux density (pfd) limits to those that conclude that a more restrictive pfd on non-GSO fixed-satellite systems is necessary to protect the fixed service.

Agenda item 1.20 “to consider the results of studies, and proposals for regulatory measures regarding the protection of the Earth exploration-satellite service (passive) from unwanted emissions of active services in accordance with Resolution 738 (WRC-03)”

Resolution 738 (WRC-03) calls for studies on the compatibility analyses between EESS (passive) and the corresponding active services in certain bands listed below with a view to updating Recommendation ITU-R SM.1633 or developing additional Recommendations.

EESS (passive) band	Active service band	Active service
1 400-1 427 MHz	1 350-1 400 MHz	Fixed service (FS) Mobile service (MS) Radiolocation service
1 400-1 427 MHz	1 427-1 429 MHz	FS, MS (except aeronautical mobile service) and space research service* (Earth-to-space)
1 400-1 427 MHz	1 429-1 452 MHz	FS and MS
23.6-24 GHz	22.55-23.55 GHz	Inter-satellite service
31.3-31.5 GHz	30-31 GHz	FSS (Earth-to-space)

50.2-50.4 GHz ¹	50.4-51.4 GHz ¹	FSS (Earth-to-space) ¹
50.2-50.4 GHz ¹	47.2-50.2 GHz (Regions 2 and 3) 49.44-50.2 GHz ¹ (Region 1)	FSS ¹

¹ Studies in this band must take into account No. **5.340.1** of the Radio Regulations.

* An apparent anomaly is present in the text of Resolution 738 (WRC-03) with respect to the active services in the band 1 427-1 429 MHz. According to the Table in the Resolution, the fixed, mobile (except aeronautical mobile) and space research (Earth-to-space) services are to be considered in this band. In fact, the band 1 427-1 429 MHz is allocated to the fixed, mobile (except aeronautical mobile) and space operation (Earth-to-space) services.

Resolves 2 of Resolution 738 (WRC-03) invites the ITU-R to further study the impact of implementing the values provided in *considering f*) and *g*) for unwanted emissions of fixed-service systems operating in Regions 2 and 3, taking into account that the impact on fixed-service systems in Region 1 has already been investigated.

According to Recommendation ITU-R SM.1633, the EESS (passive) in the band 31.3-31.5 GHz can be protected if the unwanted emissions of fixed-service systems (except high-altitude platform stations) operating in the band 31.0-31.3 GHz do not exceed –38 dBW in a 100 MHz reference bandwidth in the band 31.3-31.5 GHz (*considering f*).

According to Recommendation ITU-R SM.1633, the EESS (passive) in the band 52.6-54.25 GHz can be protected if the unwanted emissions of fixed-service systems operating in the band 51.4-52.6 GHz do not exceed –33 dBW in a 100 MHz reference bandwidth in the band 52.6-54.25 GHz (*considering g*). The results of Rec. ITU-R SM.1633 (in particular, *considering f and g*) were based on the use of values obtained from Rec. ITU-R SA.1029-1 which have been superceded by Rec. ITU-R SA.1029-2. However, these values were not re-examined during the studies of ITU-R TG 1/9.

CGMS Objective

CGMS support the protection of these EESS (passive) allocations that are of vital interest to the future of satellite-based retrievals for significantly enhancing weather prediction and climate models on a global scale. CGMS members are encouraged, through the appropriate radio frequency management representatives within their administrations, to take an active role in the development of proposals and positions within their administration’s preparatory process for the CPM and WRC-07.

Status

Task Group 1/9 is conducting compatibility studies that are expected to update the annexes to Recommendation ITU-R SM.1633 “Compatibility analysis between a passive service and an active service allocated in adjacent and nearby bands.” The analysis methodology used in such studies is also under review, with emphasis on

the emission and radiation model, the sensitivity analysis and frequency dependent rejection as well as documentation and quantifying approximations used in the studies. The concluding meeting of TG 1/9 in September 2006 focused on finalizing the draft CPM text which concluded, based on studies, that only the 50.2-50.4 GHz band would require mandatory limits on the fixed-satellite service in the adjacent bands. This final meeting also discussed the possible format revision of Recommendation ITU-R SM.1633 into multiple Recommendations and a Report.

2. Items of interest to CGMS members for consideration at a future conference

The items of interest to CGMS members for consideration at a future conference are listed here. The presentation is organized to align with Agenda for the WRC-10 as presented in Resolution 803 (WRC-03). Not all of the items in that agenda are of interest to the CGMS and therefore only those specific agenda items, relating to CGMS issues, are presented herein.

Agenda item 2.2 “to consider frequency allocations between 275 GHz and 3 000 GHz taking into account the result of ITU-R studies in accordance with Resolution 950 (WRC-03)”

Agenda item 2.7 “to consider the progress of ITU-R studies concerning the technical and regulatory issues relative to the fixed service in the 81-86 and 92-100 GHz frequency bands, taking into account Resolutions 731 (WRC-2000) and 732 (WRC-2000)”

Agenda item 2.8 “to consider the progress of the ITU-R studies concerning the development and regulatory requirements of terrestrial wireless interactive multimedia applications, in accordance with Recommendation 951 (WRC-03) and to take any appropriate action on this subject”

Other items of interest to CGMS which are not currently proposed for any WRC agenda include:

- To review footnote 5.332 and 5.335A of the Radio Regulations (RR) with respect of the frequency band 1 215-1 260 MHz and 1260-1300 MHz concerning the Earth exploration-satellite (active) service and other services
- *To highlight the importance and restrictions imposed on the 1544-1545 MHz band under RR footnote 5.356 for safety and distress communications by modifying the Table of Frequency Allocations of the ITU Radio Regulations.*
- Review the need for RR footnotes 5.536A and 5.536B appended to the allocations to the space science services in the 25.25-27.5 GHz band.